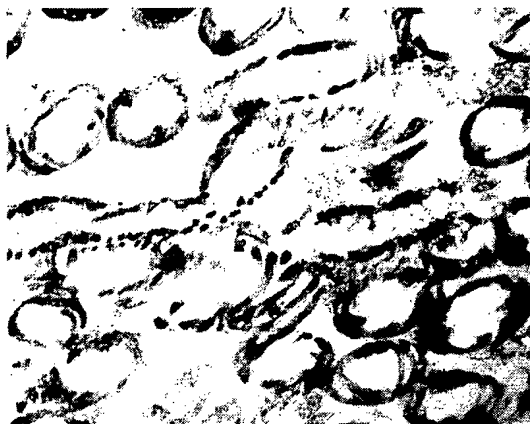
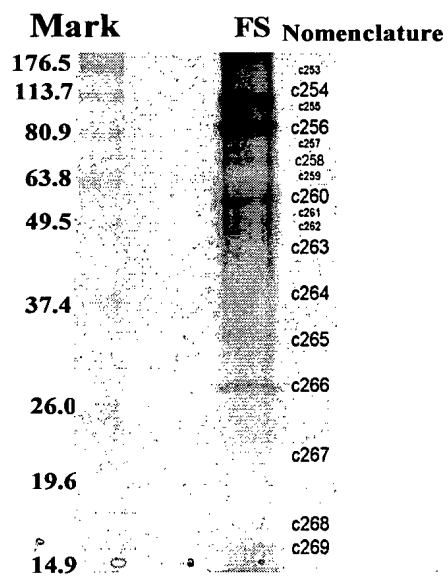


**Figure 1. Isolation of human Fibrous Sheath****Figure 2. SDS-PAGE of human fibrous sheath proteins**

### Figure 3. Microsequencing of Fibrous Sheath Proteins

Each band of fibrous sheath protein was microsequenced by mass spectrometry. The sequence result was summarized in table 1. The band C265 was identified as an unknown protein (DKFZp434N1235). Peptides microsequenced from the C265 band are indicated by bold.

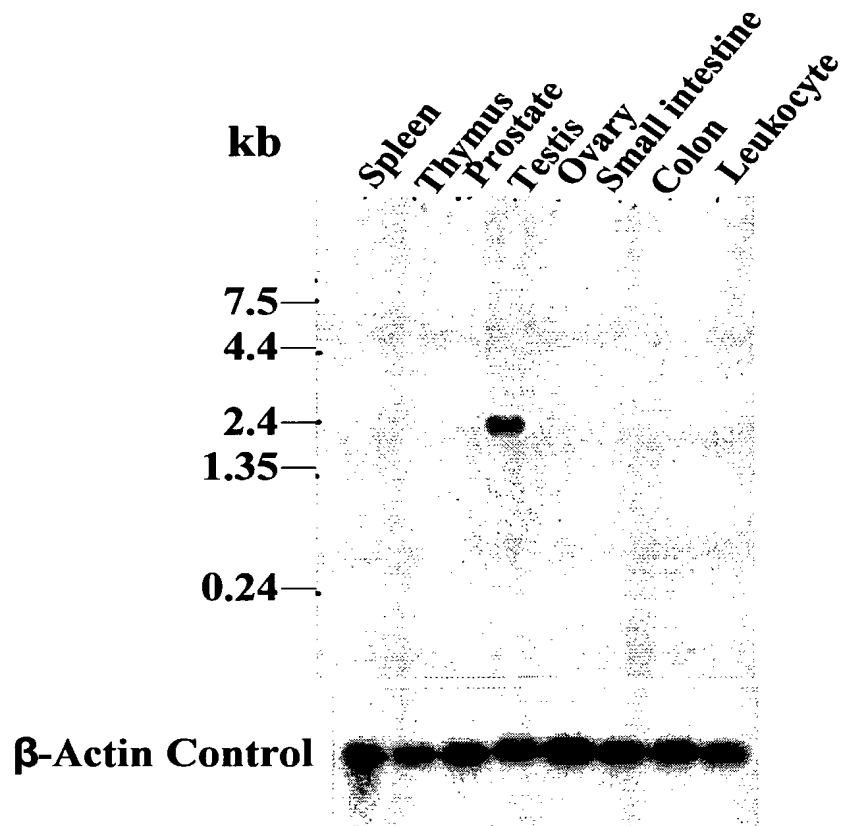
#### Microsequencing of C265 by Mass Spectrometry

mhrepakkka ekrlfdassf **gkdllaggva** aavsktavap iervklillqv qasskqispe  
arykgmvdcl vripreqgff sfwrgnlanv iryfptqaln fafkdokyql fmsgvnkekq  
fwrwflanla sggaagatsl cvvypldfar trlgvdigkg peerqfkglg dcimkiaksd  
giaglyqgfg vsvqgiivyr **asyfgaydtv** **kgllpkpkkt** pflvsffiaq vvtcsgils  
ypfdtvrrrm mmqsgeakrq **ykgtdcfvk** **iyqhegissf** **frgafsnvlr** gtggalvlvl  
ydkikeffhi diggr

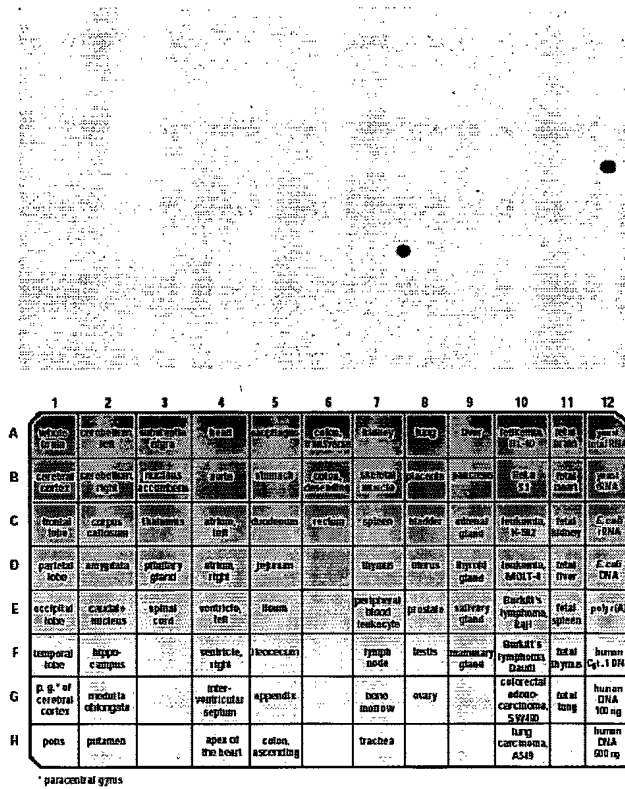
#### Mouse Orthologues of SFEC

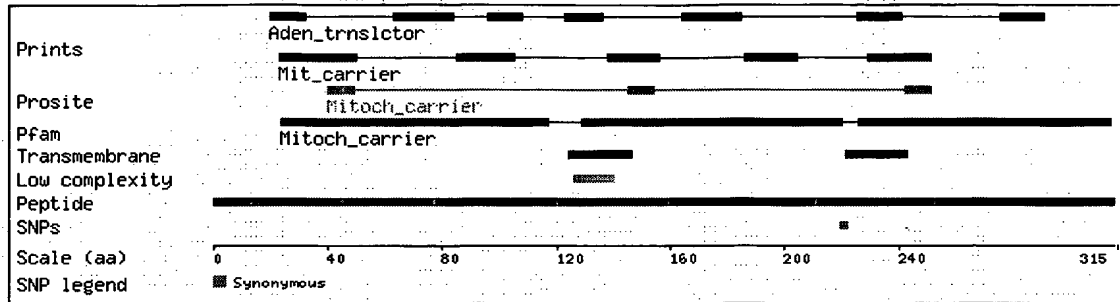
msnesskkqs skkalldpvs fskdllaggv aaavskttva piervklillq vqasskqisp  
earykgmldc lvripreqgf lsywrgnlan viryfptqal nfafkdokyke lfmsgvnkek  
qfwrwflanl asggaagats lcvvypldfa rtrlgvdigk gpeqrqftgl gdcimkiaks  
dgliglyqgf gvsvqgiivy rasyfgaydt vkgllpkpkke tpflvsfiia qivttcsgil  
syfdtvrrr mmmqsgesdr qykgtdcfl kiyrhegvpa ffrgafsnil rgtggalvlv  
lydkikefln idvgsssgd

**Figure 4. SFEC is a testis specific Protein- Northern Analysis**



**Figure 5- Dot blot analysis (upper panel) and human MTE array (lower panel) demonstrating testis specific expression of SFEC**



**Figure 6- Functional Domains of SFEC**

Domain type	Accession number	Description	Start	End
prints	<a href="#">PR00926</a>	Mit_carrier	23	36
prints	<a href="#">PR00926</a>	Mit_carrier	36	50
prints	<a href="#">PR00926</a>	Mit_carrier	85	105
prints	<a href="#">PR00926</a>	Mit_carrier	138	156
prints	<a href="#">PR00926</a>	Mit_carrier	186	204
prints	<a href="#">PR00926</a>	Mit_carrier	229	251
prints	<a href="#">PR00927</a>	Aden_trnslctor	20	32
prints	<a href="#">PR00927</a>	Aden_trnslctor	63	84
prints	<a href="#">PR00927</a>	Aden_trnslctor	96	108
prints	<a href="#">PR00927</a>	Aden_trnslctor	123	136
prints	<a href="#">PR00927</a>	Aden_trnslctor	164	185
prints	<a href="#">PR00927</a>	Aden_trnslctor	225	241
prints	<a href="#">PR00927</a>	Aden_trnslctor	275	290
Pfam	<a href="#">PF00153</a>	Mitoch_carrier	24	117
Pfam	<a href="#">PF00153</a>	Mitoch_carrier	129	220
Pfam	<a href="#">PF00153</a>	Mitoch_carrier	226	314
prosite	<a href="#">PS00215</a>	Mitoch_carrier	40	49
prosite	<a href="#">PS00215</a>	Mitoch_carrier	145	154
prosite	<a href="#">PS00215</a>	Mitoch_carrier	242	251

Domain type	Start	End
Transmembrane	124	146
Transmembrane	221	243
Low complexity	126	140

**Figure 7. Alignment of Amino Acid Sequences of SFEC with other human proteins having a similar domains**

CLUSTAL W (1.74) multiple sequence alignment

```

unk|VIRT5947|Blast_submission      MHREPAKKKAIEKRLFDASSFGKDLLAGGVAAAVSKTAVAPIERVKLLQV
tr|Q9HOC2                          MHREPAKKKAIEKRLFDASSFGKDLLAGGVAAAVSKTAVAPIERVKLLQV
sp|P12235|ADT1_HUMAN               -----MGDHAWSFLKDFLAGGVAAAVSKTAVAPIERVKLLQV
sp|P12236|ADT3_HUMAN               -----MTEQAISFAKDFLAGGIAAAISKTAVAPIERVKLLQV
sp|P05141|ADT2_HUMAN               -----MTDAAVSFAKDFLAGGVAAAVSKTAVAPIERVKLLQV
                                   *  *  *:****:***:*****

unk|VIRT5947|Blast_submission      QASSKQISPEARYKGNVDCLVRIPREQGFFSFWRGNLANVIRYFPTQALN
tr|Q9HOC2                          QASSKQISPEARYKGNVDCLVRIPREQGFFSFWRGNLANVIRYFPTQALN
sp|P12235|ADT1_HUMAN               QHASKQISAEKQYKGIIDCVVRIPKEQGFLSFWRGNLANVIRYFPTQALN
sp|P12236|ADT3_HUMAN               QHASKQIAADKQYKGIIDCVVRIPKEQGVLSFWRGNLANVIRYFPTQALN
sp|P05141|ADT2_HUMAN               QHASKQITADKQYKGIIDCVVRIPKEQGVLSFWRGNLANVIRYFPTQALN
                                   * :****:.. :***:***:****:***:*****

unk|VIRT5947|Blast_submission      FAFKDKYKQLFMSGVNKEKQFWRUFLANLASGGAAGATSLCVVYPLDFAR
tr|Q9HOC2                          FAFKDKYKQLFMSGVNKEKQFWRUFLANLASGGAAGATSLCVVYPLDFAR
sp|P12235|ADT1_HUMAN               FAFKDKYKQLFLGGVDRHKQFURYFAGNLASGGAAGATSLCFVYPLDFAR
sp|P12236|ADT3_HUMAN               FAFKDKYKQIFLGGVDKHTQFURYFAGNLASGGAAGATSLCFVYPLDFAR
sp|P05141|ADT2_HUMAN               FAFKDKYKQIFLGGVDKRTQFURYFAGNLASGGAAGATSLCFVYPLDFAR
                                   *****:*. :***:..*****:*****

unk|VIRT5947|Blast_submission      TRLGVDIGKGPEERQFQKGLGDCIMKIAKSDGIAGLYQGFQGVSVQGIIVYR
tr|Q9HOC2                          TRLGVDIGKGPEERQFQKGLGDCIMKIAKSDGIAGLYQGFQGVSVQGIIVYR
sp|P12235|ADT1_HUMAN               TRLAADVKGGAQREFHGLGDCIIFKSDGLRGLYQGFNVSVQGIIVYR
sp|P12236|ADT3_HUMAN               TRLAADVKGSGTEREFRGLGDCLVKITKSDGIRGLYQGFNVSVQGIIVYR
sp|P05141|ADT2_HUMAN               TRLAADVKGKAGAREFRGLGDCLVKITKSDGIRGLYQGFNVSVQGIIVYR
                                   ***.:*. :*:*****:*** *****:*****

unk|VIRT5947|Blast_submission      ASYFGAYDVTVKGLLPKPKKTPFLVSFFIAQVVTTCSGILSYPPDVTVRMM
tr|Q9HOC2                          ASYFGAYDVTVKGLLPKPKKTPFLVSFFIAQVVTTCSGILSYPPDVTVRMM
sp|P12235|ADT1_HUMAN               AAYFGVYDTAKGHLDPDPKNVHIFVSWHIAQSVTAVAGLVSYPPDVTVRMM
sp|P12236|ADT3_HUMAN               AAYFGVYDTAKGHLDPDPKNTHIVVSWHIAQTVTAVAGVSYPPDVTVRMM
sp|P05141|ADT2_HUMAN               AAYFGIYDTAKGHLDPDPKNTHIVSWHIAQTVTAVAGLTSYPPDVTVRMM
                                   *:*** ***:***:***:.. :*:*** ***: :*: *****

unk|VIRT5947|Blast_submission      HMQSGE--AKRQYKGTLDQFVKIYQHEGISSFFRGAFSNVLRGTGGALVL
tr|Q9HOC2                          HMQSGE--AKRQYKGTLDQFVKIYQHEGISSFFRGAFSNVLRGTGGALVL
sp|P12235|ADT1_HUMAN               HMQSGRKGADIMYTGTVDQWRKIARDEGGAFFKGAUSNVLRGMGGAFVL
sp|P12236|ADT3_HUMAN               HMQSGRKGADIMYTGTVDQWRKIFRDEGGAFFKGAUSNVLRGMGGAFVL
sp|P05141|ADT2_HUMAN               HMQSGRKGTDIMYTGTLDQWRKIARDEGGAFFKGAUSNVLRGMGGAFVL
                                   *****:.. :***:***: ** :*** :***:***** *****

unk|VIRT5947|Blast_submission      VLYDKIKEFFHIDIGGR
tr|Q9HOC2                          VLYDKIKEFFHIDIGGR
sp|P12235|ADT1_HUMAN               VLYDEIKKYV-----
sp|P12236|ADT3_HUMAN               VLYDELKKVI-----
sp|P05141|ADT2_HUMAN               VLYDEIKKYT-----
                                   *****:

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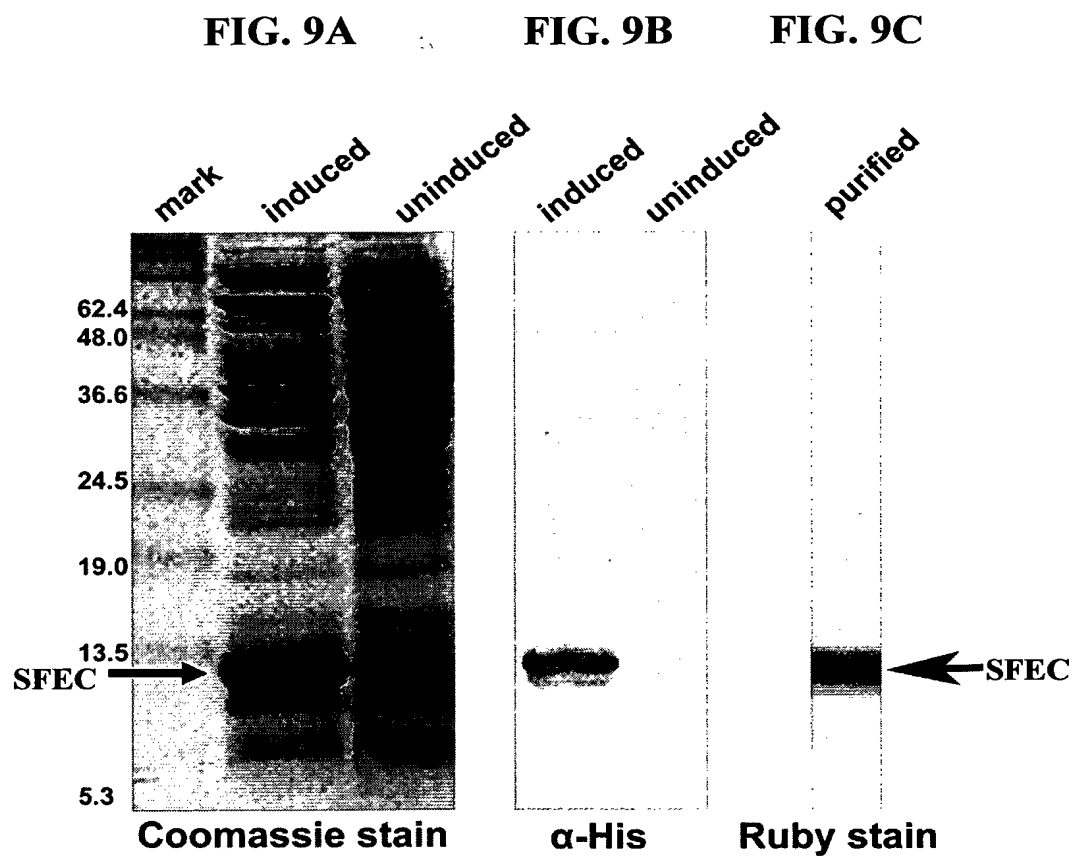
**Heart (ADT 1): identity (69%) similarity (79%)**

**Liver (ADT 3): identity (67%), similarity (80%)**

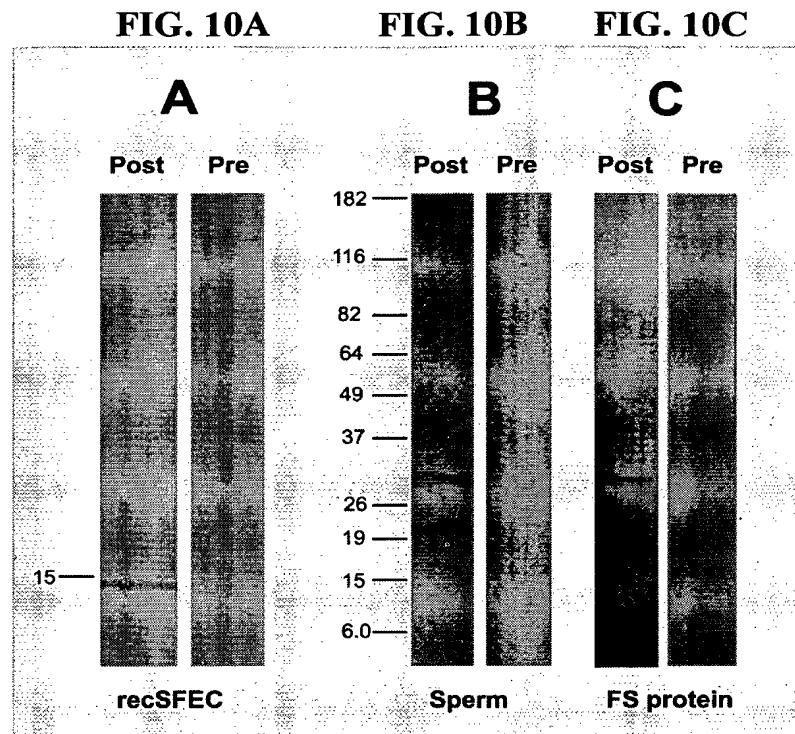
**Fibroblast (ADT 2): identity (67%), similarity (79%)**

**Figure 8. Human Fibrous Sheath Peptides involved in Energy Production**

<b>Gene/Gene Symbol</b>	<b>Peptides</b>	<b>Gene Locus</b>	<b>Tissue Distribution</b>
Aldolase A, Fructose- biphosphate ALDOA	1)GILAADESTGSIK 2)IGEHTPSALAIMENANVLAR 3)GVVPLAGTNGETTTQGLDGLSER 4)FSHEEIAMATVTALR 5)IGEHTPSALAIMENANVLAR	16q22-q24	Ubiquitously expressed
Pyruvate Kinase PKM2, Unkown protein	1)NTGIICTIGPASR 2)GADFLVTEVENGGSLGSK 3)GVNLPGAADVLPVSEK 4)TATESFASDPILYRPVAVALDTK	15q22CM	Ubiquitously expressed
Sorbitol Dehydrogenase SORD	1)LENYPIPEPGPNEVLLR	15q15.3cM	Ubiquitously expressed (spermatogenic cells)
Lactate Dehydrogenase LDHA	1)DYNVTANSK 2)VTLTSEEEAR 3)VIGSGCNLDSAR 4)LVIITAGAR 5)SADTLWGIQK 6)DQLIYNLLKEEQTPQNK 7)LKGEMMDLQHGSFLR 8)DLADELALVDVIEDK	11p15.4	Ubiquitous
Triosephosphate Isomerase 1 TPI1	1)TATPQQAQEVHEK 2)LDEREAGITEK 3)IAVAAQNCYK 4)SNVSDAVAQSTR 5)IIYGGSVTGATCK 6)VTNGAFTGEISPGMIK 7)HVFGESEDELIGQK 8)FFVGGNWK 9)DCGATWVVLGHSER 10)VPADTEVVCAPPTAYIDFAR 11)VVLAYEPVWAIGTGK 12)QSLGELIGTLNAAK 13)KFFVGGNWK 14)RHVFGESEDELIGQK 15)KQSLGELIGTLNAAK 16)VAHALAEGLGVIACIGEK	12p13	Ubiquitously expressed

**Figure 9- Expression and Purification of recombinant SFEC**



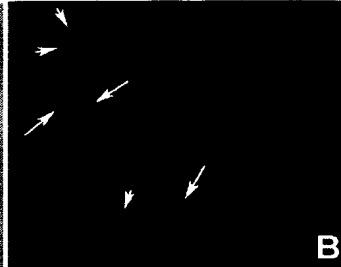
**Figure 10- Western Analysis of SFEC**

**Figure 11- Localization of SFEC to the Principal Piece of the Flagellum**

**FIG. 11A**



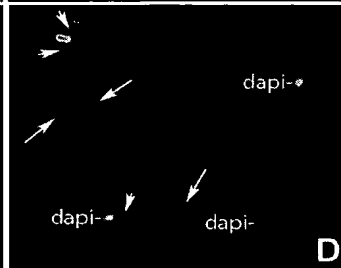
**FIG. 11B**



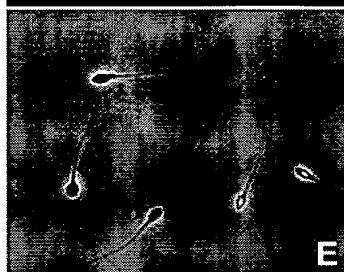
**FIG. 11C**



**FIG. 11D**



**FIG. 11E**



**FIG. 11F**

